

**ORIGINAL ARTICLE**

# Clinical Profile of Snake Bite at A Tertiary Care Centre - One Year Study

Viney Sambyal, Deepak Bharti, Annil Mahajan

**Abstract**

A hospital record-based retrospective descriptive study was carried out study is to assess the clinical profiles and manifestations of snakebite patients in the Shivalik hills ofn Jammu division. 45 (45%) patients were in the age group of 31-45 years which is the most common presenting age group in our study and the number of male patients were 57 (57%) and female patients were 43 (43%). All the cases recorded presented in the months of April to November. Not a single case was recorded in the month of January , February and December . The most frequently bitten sites was the lower limbs 47 (47%). 13 (13%) of the patients presented without any features of envenomation. Hemotoxicity with local toxicity was the commonest presentation in 34 (34%) patients followed by neuroparalysis in 22 (22%) patients. Allergic reactions in the form of early anaphylaxis were noted in 4% patients. Snake bite is a neglected tropical disease affecting poor villagers in rural areas. Future research focusing on reforming standard practice guidelines and for understanding epidemiological determinants of snake bite is desired.

**Key Words**

Envenomation, Himalayas, Neglected Tropical Disease, Reptiles

**Introduction**

Snake bite causes great morbidity and mortality in developing countries. (1) Long rainy season, agriculture-predominant occupations, rural background, and population using paths traversing rural and forest lands makes people prone to snake bites.(2) The Jammu division of J&K state is located between 32.73°N and 74.87°E covering an area of 26,293 km<sup>2</sup>. It has an average elevation of 327 m (1073 ft). Jammu city lies at uneven ridges of low heights at the Shivalik hills. It is surrounded by Shivalik range to the north,east and southeast while the Trikuta range surrounds it from northwest. The state has an estimated forest cover of 10103 km<sup>2</sup> which is 38 % of the total geographic area of the state.The state has a total population of 5,350,811 and 77.9 % people live in rural setup.(3-9) The state has an ideal environment for the different species of reptiles. Probability of human beings coming in contact with snakes is very high.

**Materials and Methods**

In a hospital record-based retrospective descriptive study, we evaluated snakebite cases admitted to the

hospital in the Department of Medicine from January 2016 to December 2016. Data were collected from the Medical Records Department of Government Medical College Jammu. Detailed history regarding age of patient,site of bite,time of bite, symptoms, region were noted.

**Results**

A total of 100 cases of snake bite were analyzed. Most of the patients were young in the age group from 31 to 45 yrs and the number of male patients was higher than female patients. The age wise distribution of patients is shown in *Table 1*.

All the cases recorded presented in the months of January to December. Maximum of 20 (40%) patients were recorded in the month of August.

No definite pattern for the time of bite was observed in our cases as is evident

from wide variability. The time of bite corresponds to the outdoor activities and relative abundance of diurnal and nocturnal snakes. It was observed that only a few() of the patients attended hospital within the 1st h of bite

**From the Department of Medicine, Government Medical College, Jammu, Jammu and Kashmir- India**

**Correspondence to :** Dr. Annil Mahajan Professor and Head, Department of Medicine, Government Medical College, Jammu, Jammu and Kashmir I irndia

and the majority attended between 1st and 6 h. 16 patients arrived at this hospital after 12 h of bite. Most of these patients were either referred from neighbouring health centers or arrived late at the appearance of symptoms or complications in the form of acute renal failure. Difficult topography, delayed transportation in addition to lack of awareness of the hazards of snakebite and initial preference for alternative systems of medicine are the main reasons for delay in arrival as reported in the past.(3) The bite-to-treatment delay varies greatly in studies from different health care centers in India (10-13). *Table 3* shows diurnal variation in the timing of snake bite with majority of the accidents happening in the evening. Most of the bites occur on lower extremities as shown in *Table 4*. Most of the patients presented with combined features of hemotoxicity and local toxicity. Hemotoxicity was the next most common presentation and was seen in 17% patients among symptomatic patients. Detailed clinical presentation is as depicted in *Table 5*.

Out of 22 patients with neuroparalytic features, 19 patients required mechanical ventilation. Acute kidney injury was observed in 7 patients and they belonged to the hemotoxic or the hemotoxic with local symptoms and signs group as depicted in *Table 8*. All the 87 symptomatic patients had received polyvalent ASV. Deaths were due to ventilator-associated pneumonia in 2, refractory shock in 1, massive gastrointestinal bleed in 1 and cardiorespiratory arrest in 1.

## Discussion

The Jammu division of J&K state is located between 32.73°N and 74.87°E covering an area of 26,293 km<sup>2</sup>. It has an average elevation of 327 m (1073 ft). Jammu city lies at uneven ridges of low heights at the Shivalik hills. It is surrounded by Shivalik range to the north, east and southeast while the Trikuta range surrounds it from northwest. The state has an estimated forest cover of 10103 km<sup>2</sup> which is 38 % of the total geographic area of the state. The state has a total population of 5,350,811 and 90.2% people live in rural setup.(9) The state has an ideal environment for the different species of reptiles. Probability of human beings coming in contact with snakes is very high.

In this study all the cases of snake bite occurred in the months of April to November, which corresponds with summer, monsoon and the harvesting season in this region, all ideal for snakebites. The maximum bites occurred during the month of August, in the rainy season, when vegetation is abundant and people are involved in intense agricultural activities. This distinct seasonal pattern with peaks in the warm and rainy months has been observed

in the state of Jammu and Kashmir, as in other parts of the country.(4) This observation is important from the prevention aspect as this is the time when maximum vigil is required to guard against the snake bites. In the present study, patients of snake bite are mostly young and predominantly males. The predominance of young male victims suggests that more ambulant population is at the highest risk for snake bite in this region and has been reported in studies from different places in India.(3,5-7) Female preponderance has been observed in a study done in another physiographic zone of lower Shivalik Himalayan region of the state. Women in hills are involved in cutting grass for fodder more frequently. No definite pattern for the time of bite was observed in our cases as is evident from wide variability. The time of bite corresponds to the outdoor activities and relative abundance of diurnal and nocturnal snakes. It was observed that only a few (6%) of the patients attended hospital within the 1st hour of bite and the majority (43%) attended between 1st and 6 h. 16 (16%) patients arrived at this hospital after 12 h of bite. Most of these patients were either referred from neighboring health centers or arrived late at the appearance of symptoms or complications in the form of acute renal failure. Difficult topography, delayed transportation in addition to lack of awareness of the hazards of snakebite and initial preference for alternative systems of medicine are the main reasons for delay in arrival as reported in the past.(9) The bite-to-treatment delay varies greatly in studies from different health care centres of India.(10-14).

Lower limbs were the commonest site of bite in 47% patients and it was followed-up by upper limbs out of which hand and fingers accounted for 41%. More exposed sites of the body were the commonly bitten sites as reported elsewhere.(9,10-15) Bites on the uncommon sites like head and trunk are mostly due to nocturnal species biting people who are asleep. Among the symptomatic patients common were hemotoxicity followed by neuroparalytic. Local signs only in the form of ecchymosis, swelling and necrosis were observed in 14% patients. The death rate in our study was 5% and compares well with the death rate from other studies across India.(15)

Out of the cases presenting with neuroparalytic syndrome 7% presented with early morning symptoms. These rare syndromes occur by krait bites. The kraits often enter the houses in search of food especially during midnight to early morning. The person sleeping on the floor/open environment is particularly susceptible to their bite. A false reassurance is created by paucity or absence

**Table 1: Age wise distribution of Snake bite patients**

<b>Age group</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
16-30	15	14	29
31-45	25	20	45
46-60	14	6	20
Above 60	3	3	6
<b>Total</b>	<b>57</b>	<b>43</b>	<b>100</b>

**Table 2 . Month wise distribution of Snake bite patients**

<b>Month</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
January	-	-	-
February	-	-	-
March	1	1	2
April	3	2	5
May	5	7	12
June	13	5	18
July	10	8	18
August	10	10	20
September	7	5	12
October	5	4	9
November	3	1	4
December	-	0	0

**Table 3. Time Distribution of Snake Bite patients**

<b>Time of Snake bite</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
6am -12 noon	12	10	22
12 noon -6 pm	15	12	27
6 pm- 12 am	22	14	36
12 am- 6 am	8	7	15

**Table 4. Site distribution of Snake bite patients**

<b>Site</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
Upper Extremity	23	18	41
Head	7	5	12
Lower Extremity	27	20	47

**Table 5. Clinical Presentation of Snake Bite patients**

<b>Presentation</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
No envenomation	8	5	13
Neuroparalysis	4	3	7
Hemotoxic	9	8	17
Local	6	8	14
Neuroparalysis and local	9	6	15
Hemotoxic and local	21	13	34

of local pain and swelling after krait bite. This may delay the treatment of envenomation. The absence of bite mark with no specific history of snake bite makes diagnosis and management complex(16,17). At our center, out of a total of the 100 patients admitted with history of snake bite 7 patients developed acute kidney injury. In India, the incidence of acute renal failure is 13-32% following viper bite Antivenom was given to all the 87 symptomatic patients. Although the dose of antivenom is not yet fixed,

the indications are well-known.

A retrospective analysis was one of the limitations of this study, since some of the important data were incomplete or insufficient and they may not reflect the exact statistics. In spite of the limitations, the data can be generalized to some extent as the study center happens to cater to one thirds of the state population. Further with strong public health infrastructure utilization and absence of organized private sector in the state lends credibility to

**Table 6 . Demographic Profile in Snake bite patients**

S.no.	Region	No. of Cases
1	Jammu	36
2	Samba	12
3	Kathua	21
4	Rajouri	2
5	Poonch	1
6	Udhampur	11
7	Reasi	10
8	Doda	3
9	Ramban	2
10	Kishtwar	2

this generalization.

### Conclusion

Snake bite is a neglected tropical disease affecting poor villagers in rural areas. The data and research from this region is primitive on the clinically important subject of bites due to reptilian fauna and their manifestations. Further studies on venom biochemistry and pharmacology are warranted. Future research focusing on understanding epidemiological determinants of snake bite is essential.

### References

1. Warrell DA. Snake bite. *Lancet* 2010;375:77-88.
2. Boyd JJ, Agazzi G, Svajda D, et al. Venomous snakebite in mountainous terrain: Prevention and management. *Wilderness Environ Med* 2007;18:190-202.
3. Sharma N, Chauhan S, Faruqi S, et al. Snake envenomation in a north Indian hospital. *Emerg Med J* 2005;22:118-20.
4. Bhardwaj A, Sokhey J. Snake bites in the hills of north India. *Natl Med J India* 1998;11:264-5.
5. Mohapatra B, Warrell DA, Suraweera W, et al. Snakebite mortality in India: A nationally representative mortality survey. *PLoS Negl Trop Dis* 2011;5:e1018.
6. Monteiro FN, Kanchan T, Bhagavath P, et al. Clinico-epidemiological features of viper bite envenomation: A study from Manipal, South India. *Singapore Med J* 2012;53:203-7.
7. Ahmed SM, Nadeem A, Islam MS, et al. Retrospective analysis of snake victims in Northern India admitted in a tertiary level institute. *J Anaesthesiol Clin Pharmacol* 2012;28:45-50.
8. Saravu K, Somavarapu V, Shastry AB, Kumar R. Clinical profile, species-specific severity grading, and outcome determinants of snake envenomation: An Indian tertiary care hospital-based prospective study. *Indian J Crit Care Med* 2012;16:187-92.
9. Alirol E, Sharma SK, Bawaskar HS, Kuch U, Chappuis F. Snake bite in South Asia: A review. *PLoS Negl Trop Dis* 2010;4:e603.
10. Srimannarayana J, Dutta TK, Sahai A, Badrinath S. Rational use of anti-snake venom (ASV): Trial of various regimens in hemotoxic snake envenomation. *J Assoc Physicians India* 2004;52:788-93.
11. Narvencar K. Correlation between timing of ASV administration and complications in snake bites. *J Assoc Physicians India* 2006;54:717-9.
12. Agarwal R, Aggarwal AN, Gupta D, Behera D, Jindal SK. Low dose of snake antivenom is as effective as high dose in patients with severe neurotoxic snake envenoming. *Emerg Med J* 2005;22:397-9.
13. Logaraj M, Thirumavalavan R, Gopalakrishnan S. Epidemiology of snakebite reported in a Medical College Hospital in Tamil Nadu. *Int J Health Allied Sci* 2013;2:53-5.
14. Halesha BR, Harshavardhan L, Lokesh AJ, et al. A study on the clinico-epidemiological profile and the outcome of snake bite victims in a tertiary care centre in southern India. *J Clin Diagn Res* 2013;7:122-6.
15. Haneef M, George DE, Babu AS. Early morning neuroparalytic syndrome. *Indian J Pediatr* 2009;76:1072.
16. Kularatne SA. Common krait (*Bungarus caeruleus*) bite in Anuradhapura, Sri Lanka: A prospective clinical study, 1996-98. *Postgrad Med J* 2002;78:276-80.
17. Chugh KS. Snake-bite-induced acute renal failure in India. *Kidney Int* 1989;35:891-907.

**Table 7 . Time taken between Snake bite and presentation**

Time of Presentation	Male	Female
Within 1 hr.	4	2
1-6 hr	25	18
6-12 hr	20	15
>12 hr	8	8

**Table 8 . Intervention Required**

Intervention	Ventilation	Hemodialysis
Number of cases	19	7